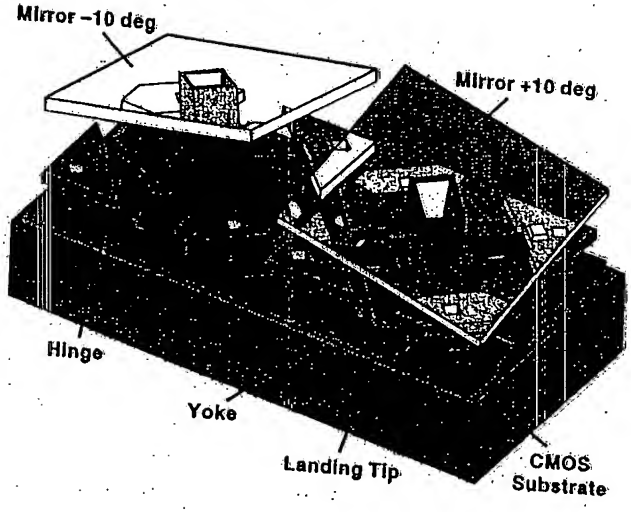
Mirror –10 deg
Mirror +10 deg
Hinge
Yoke
Landing Tip
CMOS
Substrate

FIGURE 1

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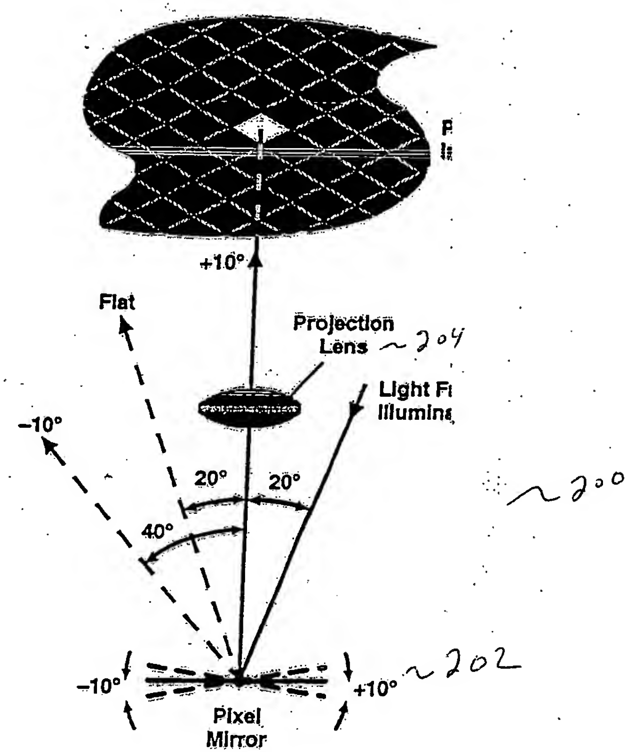


+10°
Flat
Projection Lens
~204
Light Fi
Illumin
−10°
20°
20°
~200
40°
−10°
+10°
~202
Pixel Mirror

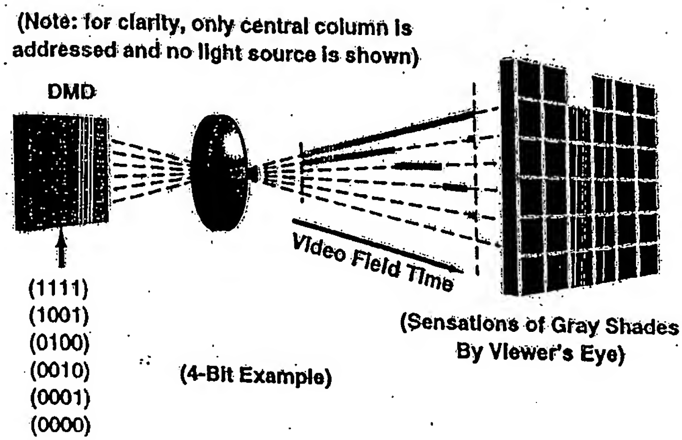
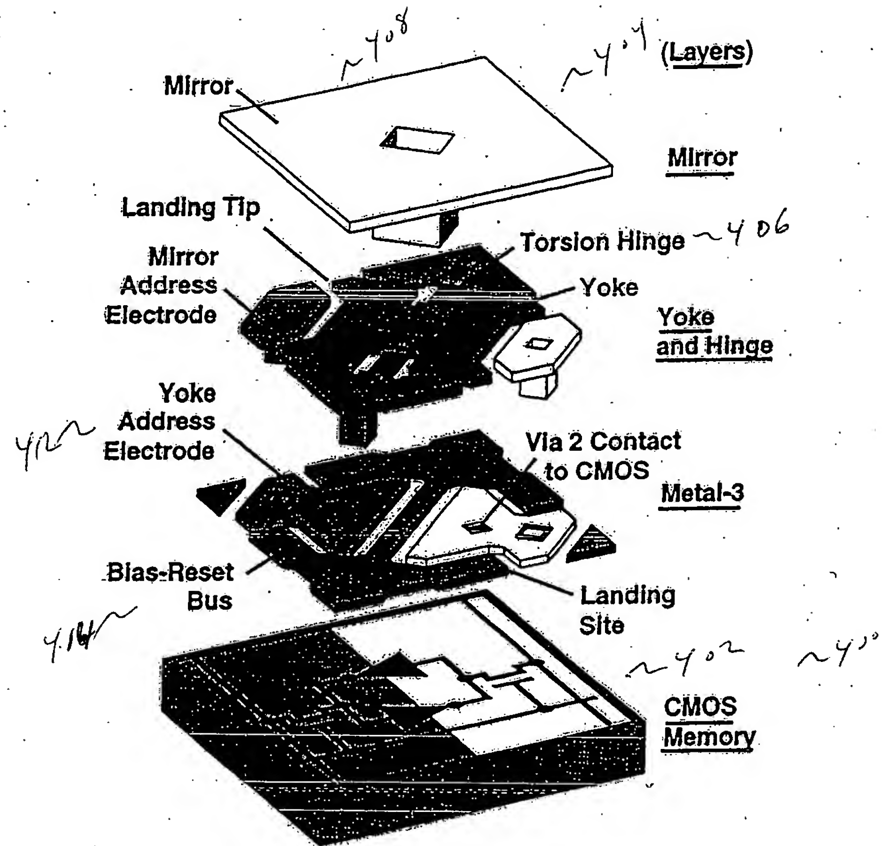

(Note: for clarity, only central column is addressed and no light source is shown)
DMD
Video Field Time
(1111)
(1001)
(0100)
(0010)
(0001)
(0000)
(4-Bit Example)
(Sensations of Gray Shades By Viewer's Eye)
~300

FIGURE 3


(Layers)
Mirror
Mirror
Landing Tip
Torsion Hinge
Mirror
Address
Electrode
Yoke
Yoke
and Hinge
Yoke
Address
Electrode
Via 2 Contact
to CMOS
Metal-3
Bias-Reset
Bus
Landing
Site
CMOS
Memory

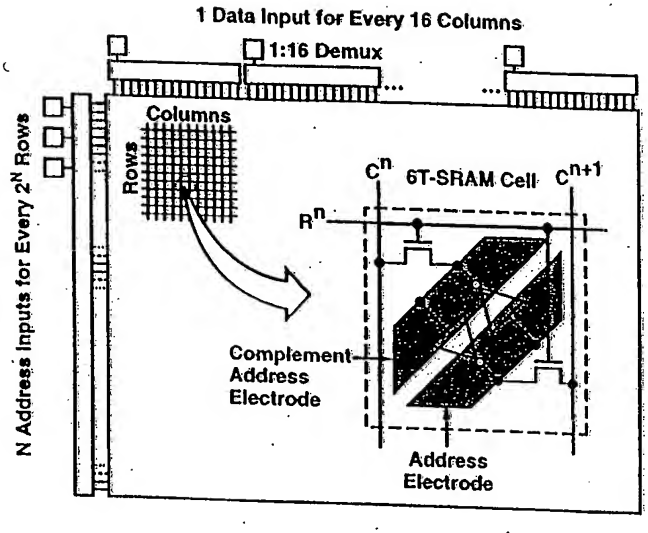

1 Data Input for Every 16 Columns
1:16 Demux
N Address Inputs for Every 2^N Rows
Columns
Rows
C^n
6T-SRAM Cell
C^{n+1}
R^n
Complement Address Electrode
Address Electrode

FIGURE 5

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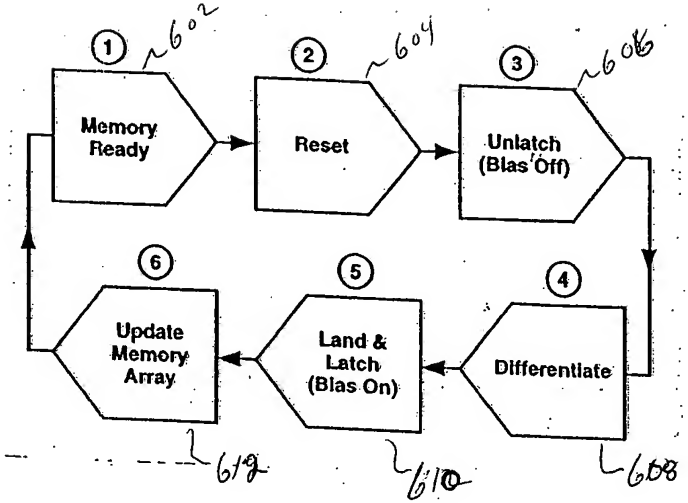
1
602
Memory Ready
2
604
Reset
3
606
Unlatch (Bias Off)
4
Differentiate
608
5
Land & Latch (Bias On)
610
6
Update Memory Array
612

FIGURE 6

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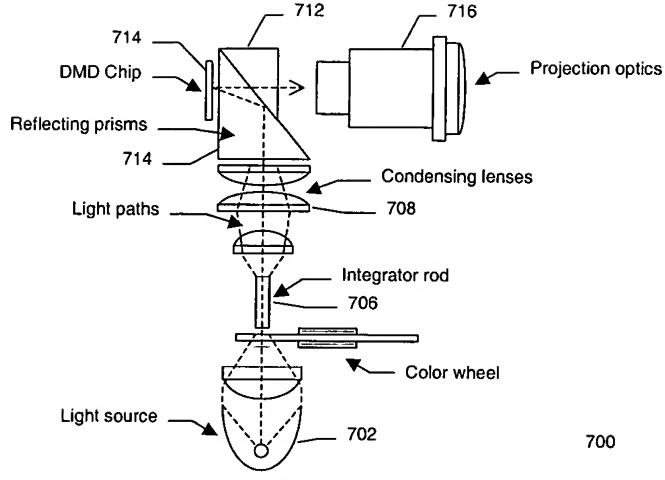

Figure 7 - Single-Chip DMD Projection System – Example 1

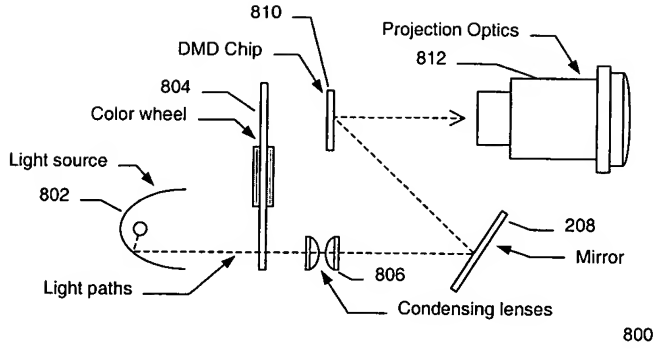

Figure 8 - Single-Chip DMD Projection System – Example 2

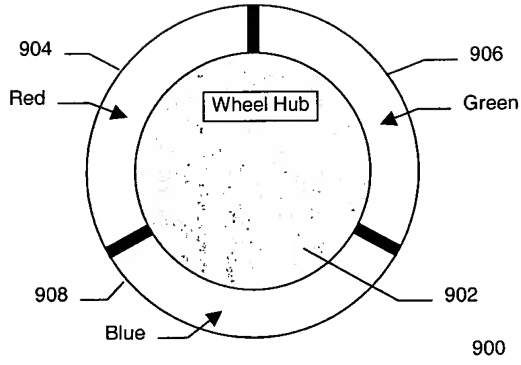

Figure 9 - Three-Segment Color Wheel for Single Chip DMD Projection Systems

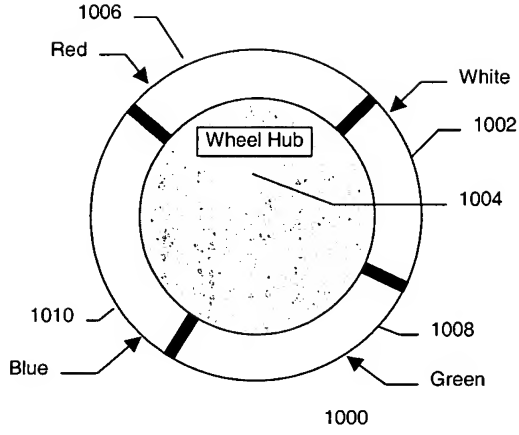

Figure 10 - Four-Segment Color Wheel for Single Chip DMD Projection Systems

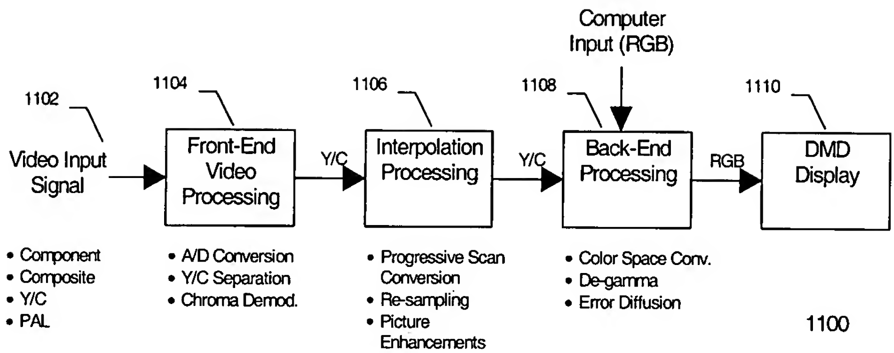

Figure 11 – 2D DMD Projector Video Processing Block Diagram for Single-Chip DLP Projector

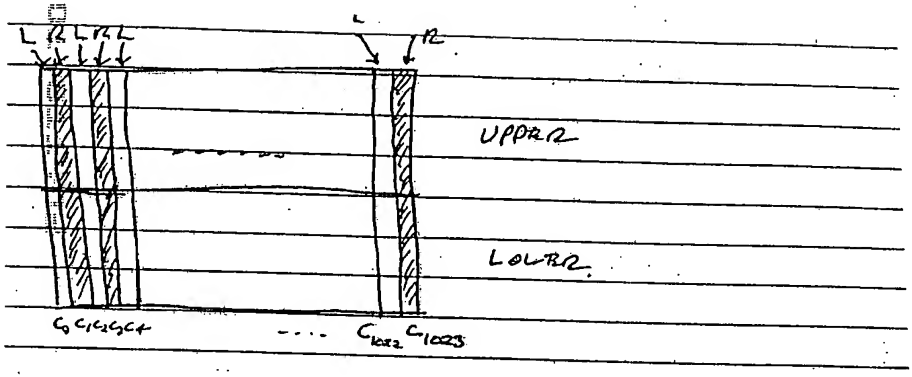

FIGURE 1B

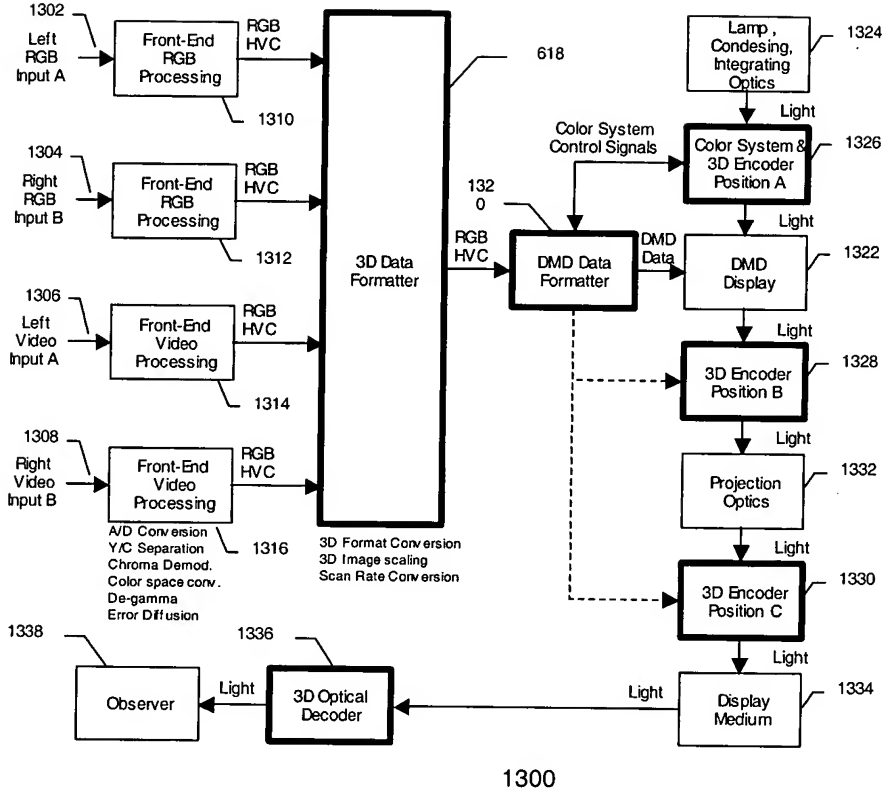

Figure 1 - Signal Flow and Optics Block Diagram for DMD Based 3D Projection System

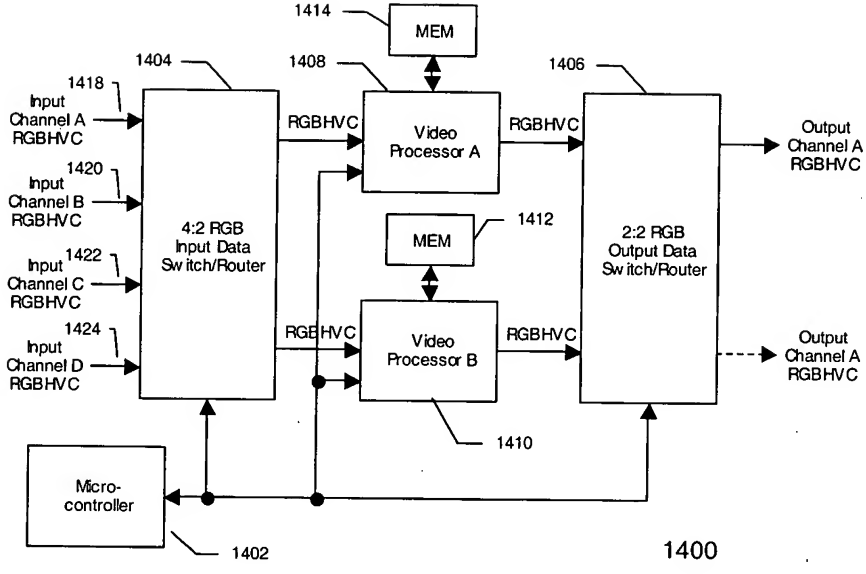

Figure 14 - 3D Data Formatter Block Diagram

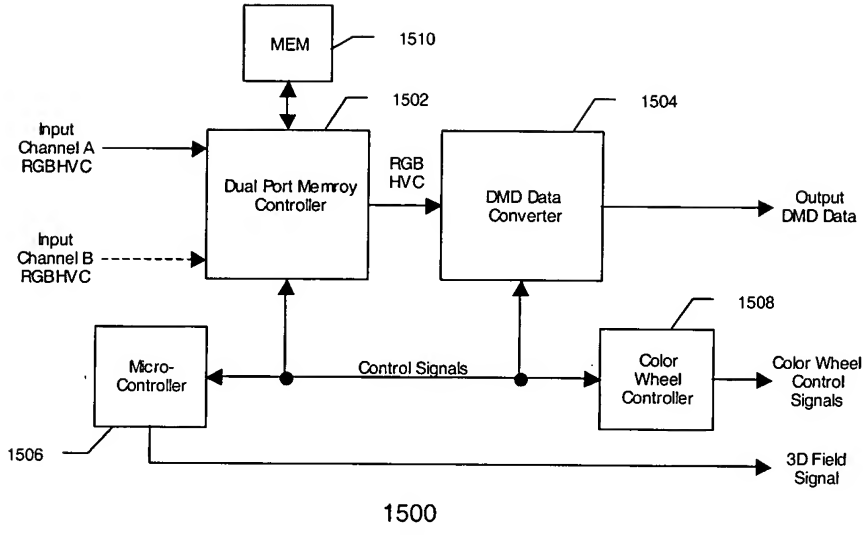

Figure 15 - DMD Data Formatter Block Diagram

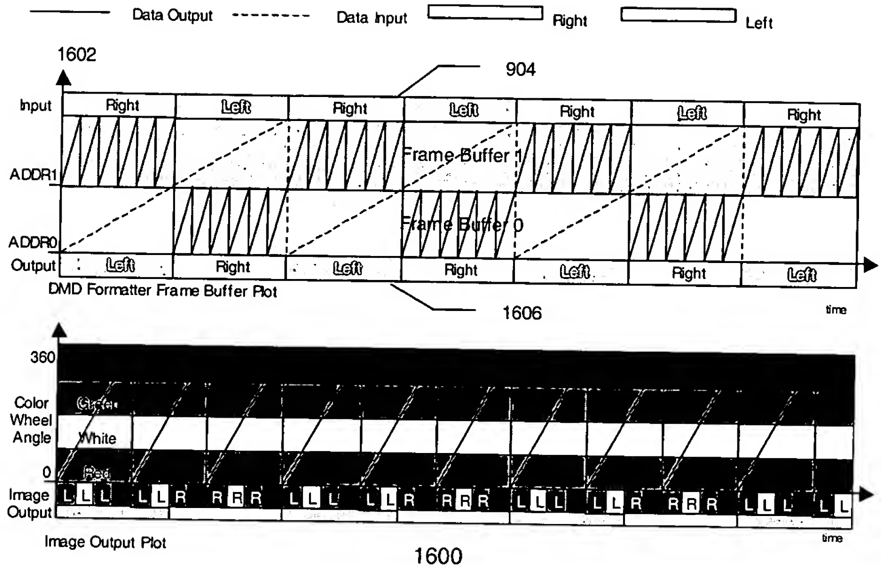

Figure 16 - DMD Data Formatter Chart for Input Synchronized Frame Sequential 3D Input Using Four-Segment Color Wheel (Chart applies to 75Hz, 80Hz, and 85Hz input signals)

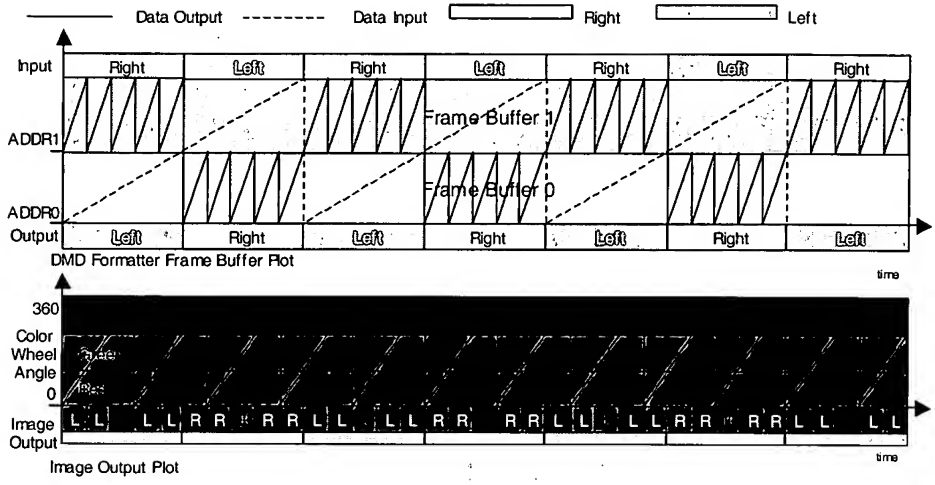

Figure 17 - DMD Data Formatter Chart for Input Synchronized Frame Sequential 3D Input Using Three-Segment Color Wheel (Chart applies to 72Hz, 75Hz, and 80Hz input signals)

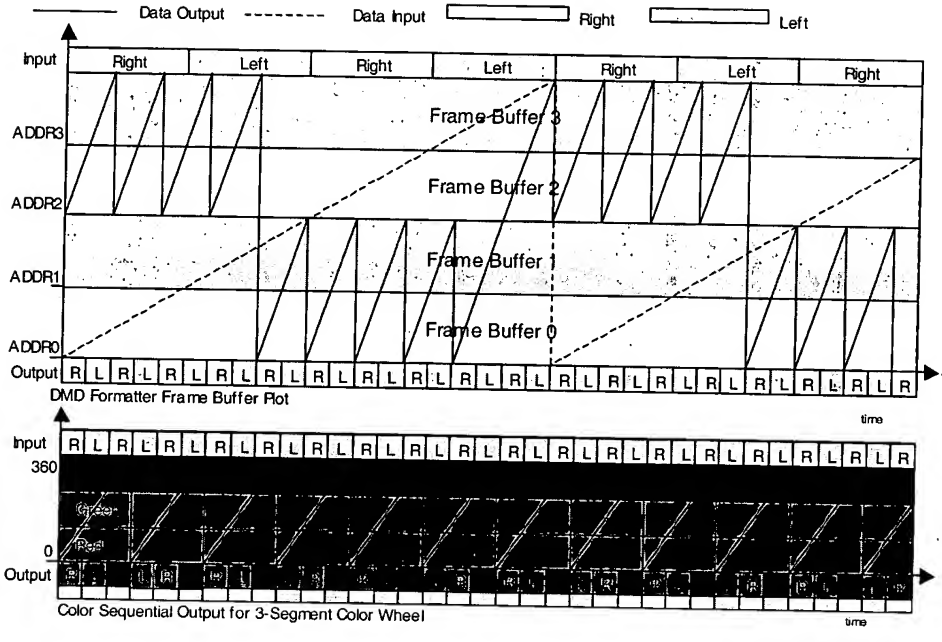

Figure 18 - Input Synchronized Color Sequential 3D Using a Three Segment Color Wheel and Quad Frame Buffer (Chart applies to 72Hz, 75Hz, and 80Hz input signals)

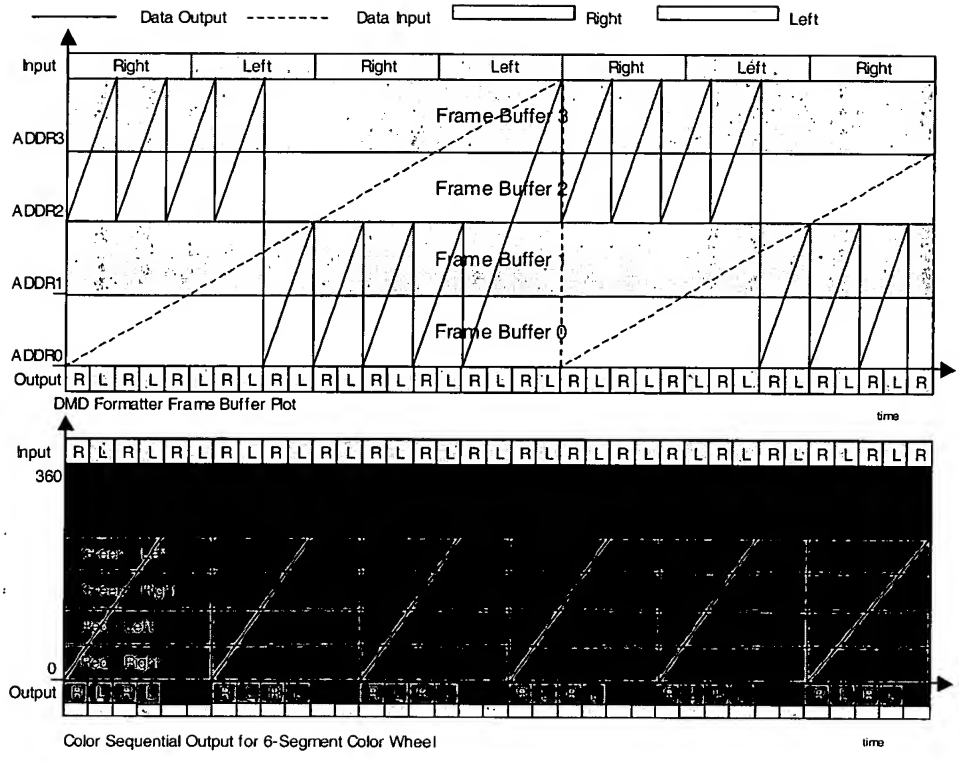

Figure 19 - Input Synchronized Color Sequential 3D Using a Six-Segment Color Wheel and Quad Frame Buffer (Chart applies to 72Hz, 75Hz, and 80Hz input signals)

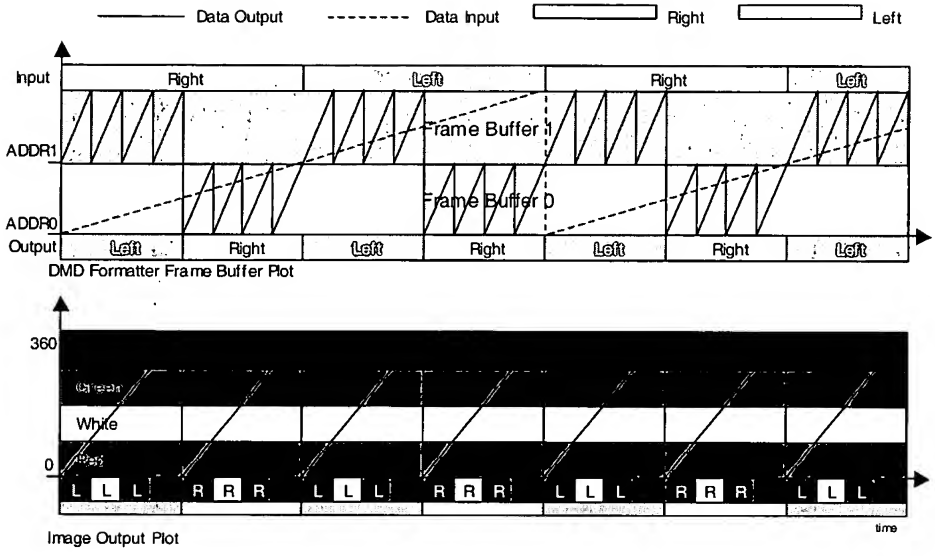

Figure 20 - DMD Formatter Chart for Output Synchronized Frame Sequential 3D Format for 60Hz Input Using a Four-Segment Color Wheel

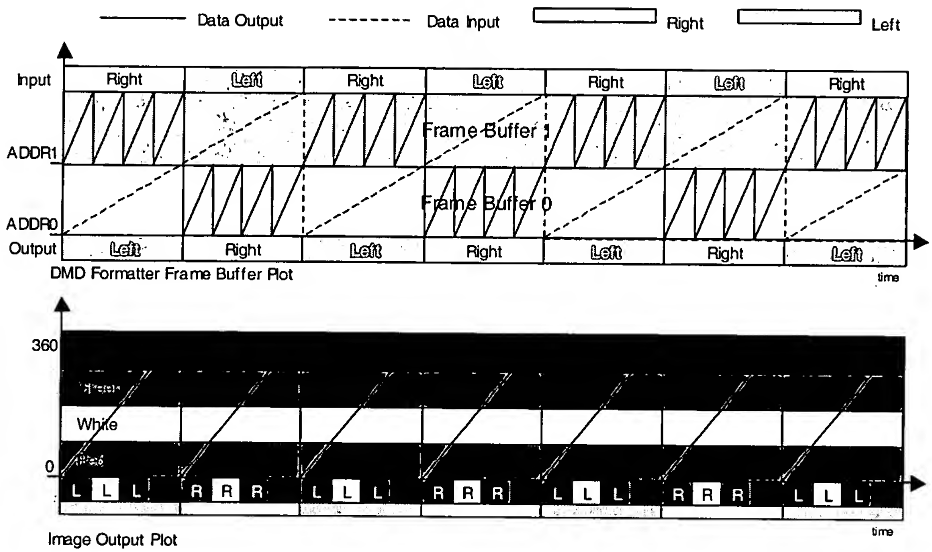

Figure 21 - DMD Formatter Chart for Output Synchronized Frame Sequential 3D Format for 120Hz Input Using a Four-Segment Color Wheel

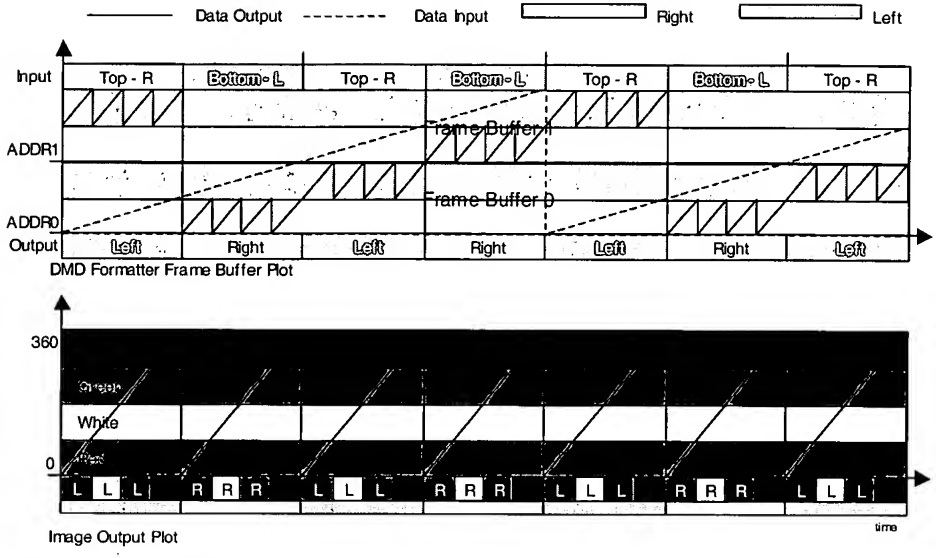

Figure 22 - DMD Formatter Chart for Output Synchronized Frame-Sequential 3D Format for 60Hz Over-Under 3D Input using a Four-Segment Color Wheel

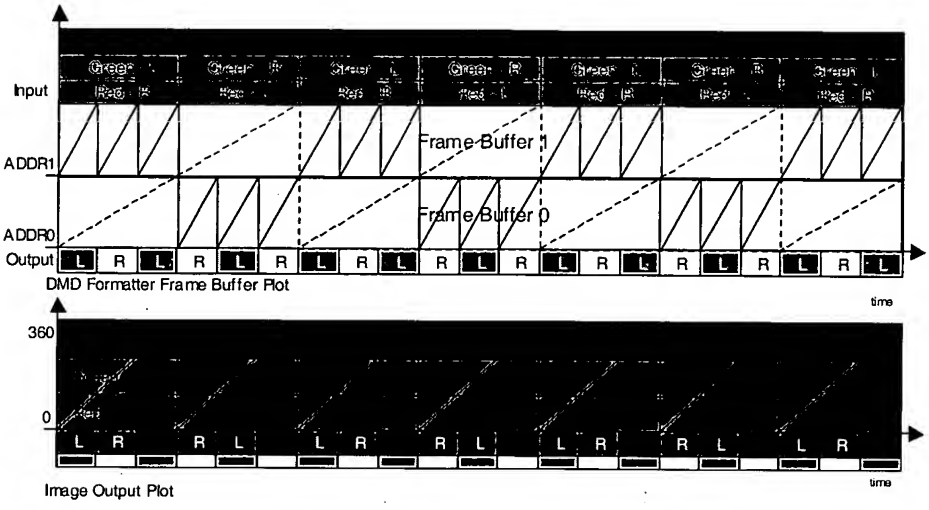

Figure 23- DMD Formatter Chart for Output Synchronized Color Sequential 3D Format for 120Hz Color-Sequential 3D Input, Using a Three-Segment Color Wheel

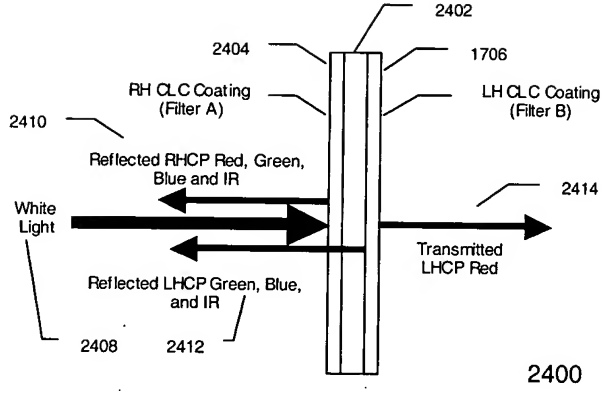

Figure 24 - Cholosteric Liquid Crystal Reflective Circular Polarizing Red Filter (Similar for White, Green, or Blue)

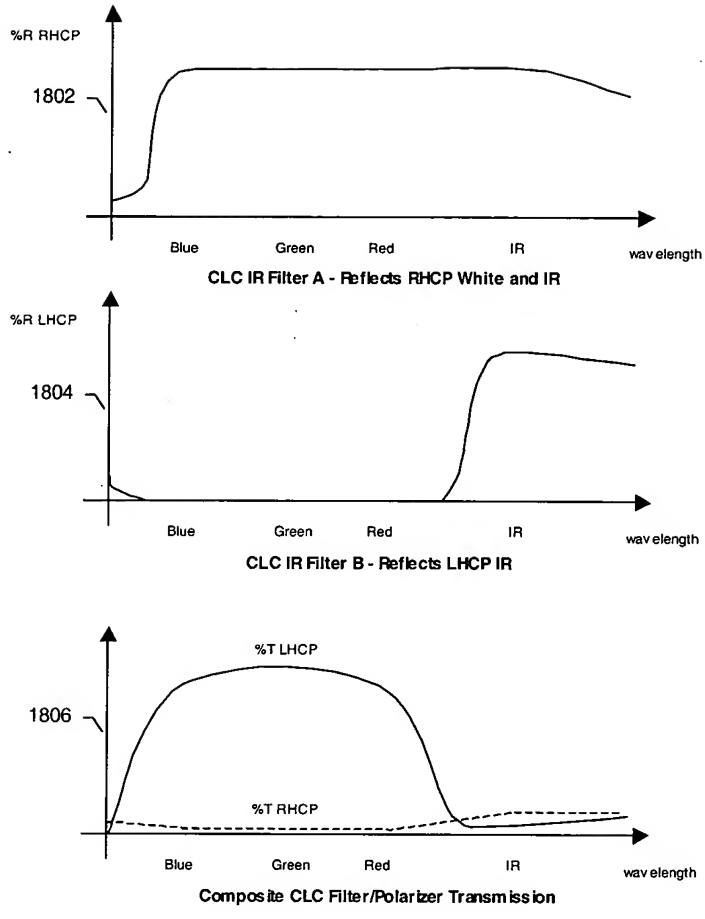

Figure 25 - Spectral Response for CLC IR Filter/Circular Polarizer

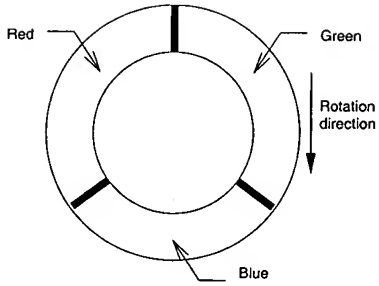

Figure 26 - Three-Segment Color Wheel Type CW-A

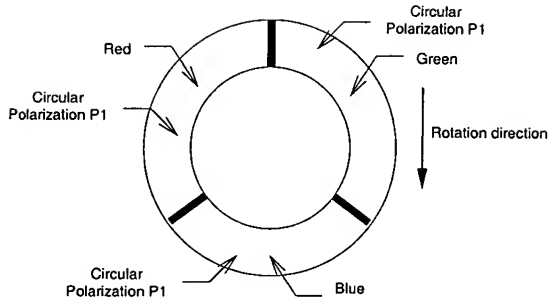

Figure 27 - Three-Segment Color Wheel Type CW-B

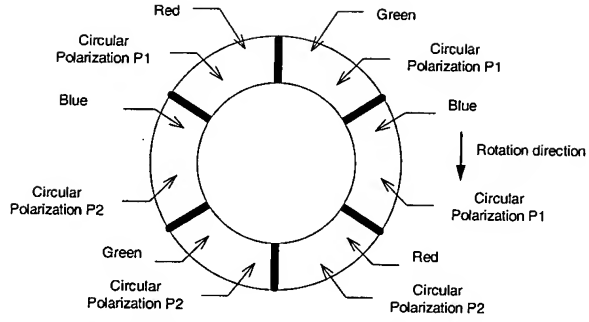

Figure 28- Six-Segment Color Wheel Type CW-C

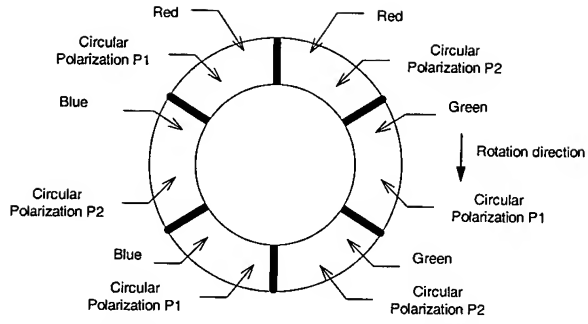

Figure 29 - Six-Segment Color Wheel Type CW-D

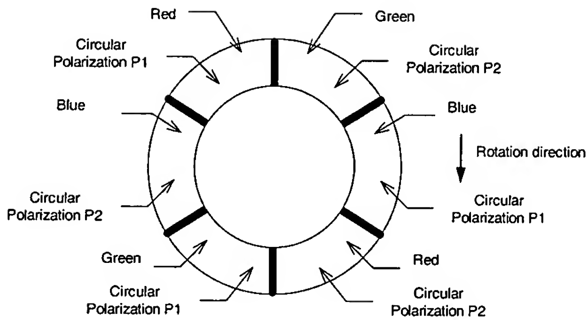

Figure 30- Six-Segment Color Wheel Type CW-E

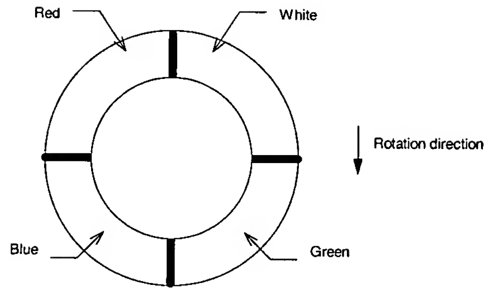

Figure 31 - Four-Segment Color Wheel Type CW-F

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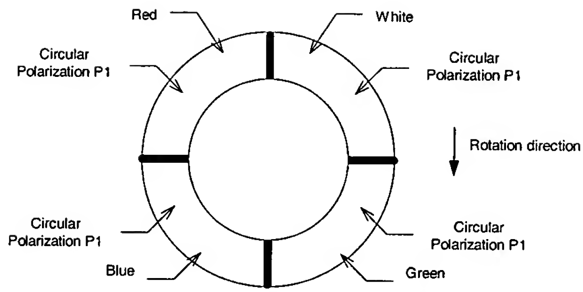


Figure 32 - Four-Segment Color Wheel Type CW-G

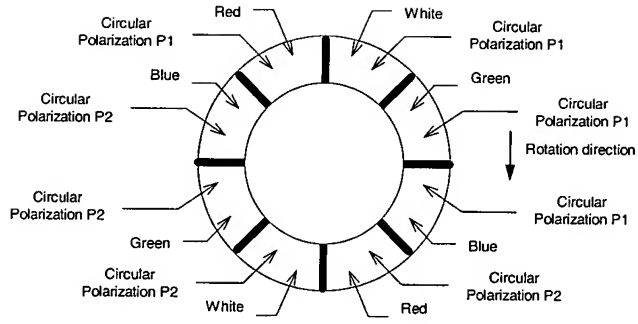


Figure 33 - Eight-Segment Color Wheel Type CW-H

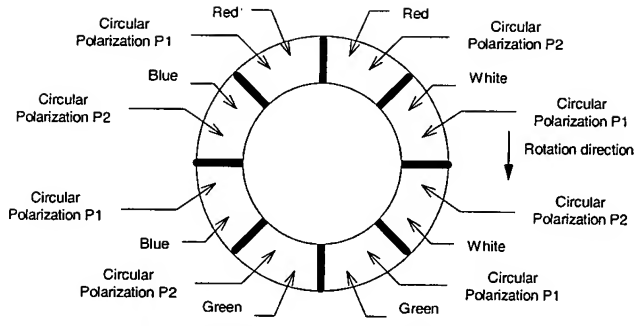


Figure 34 - Eight-Segment Color Wheel Type CW-I

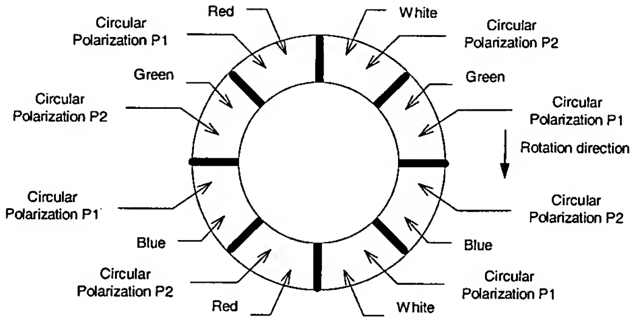


Figure 35 - Eight-Segment Color Wheel Type CW-J

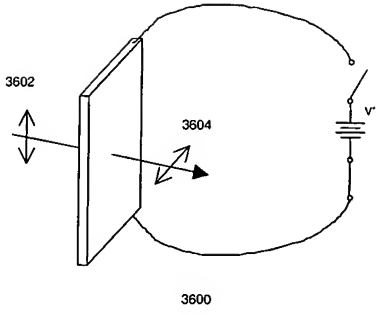
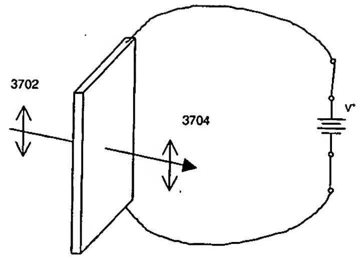


Figure 36 - Liquid Crystal Rotator with no Applied Terminal Voltage



3700

Figure 37 - Liquid Crystal Rotator with Applied Terminal Voltage

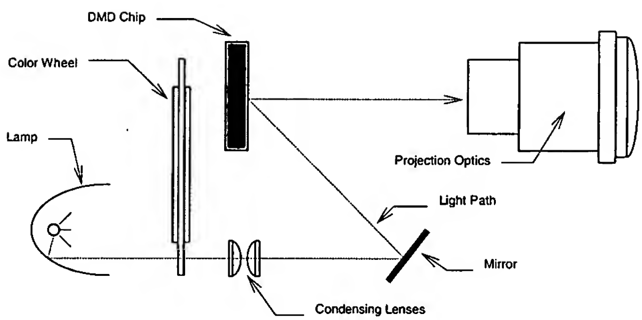


Figure 38 - DMD Based Stereo 3D Projector, 3D Optical Configurations: A, B, H, I, K, M, N, S, U, W

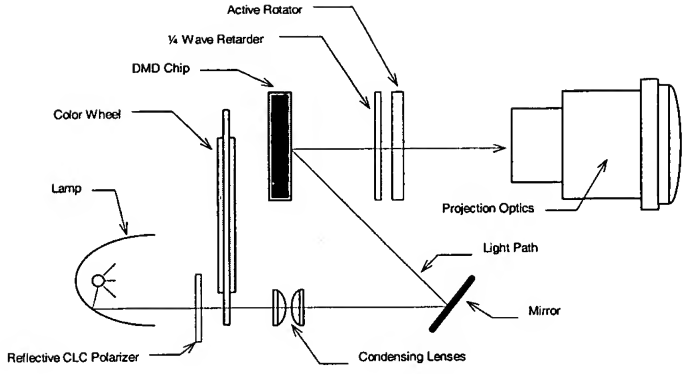


Figure 39. DMD Based Stereo 3D Projector, 3D Optical Configurations: C and O

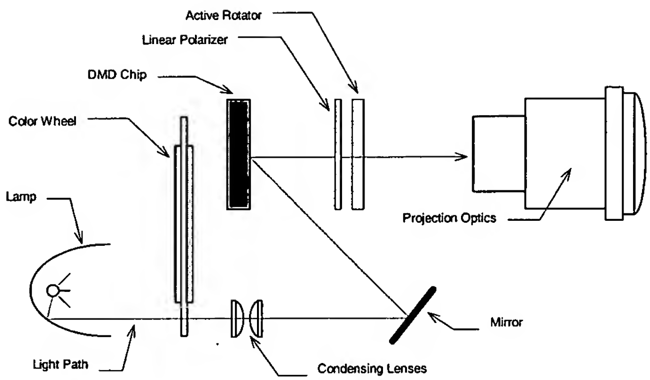


Figure 40. DMD Based Stereo 3D Projector, 3D Optical Configurations: D and P

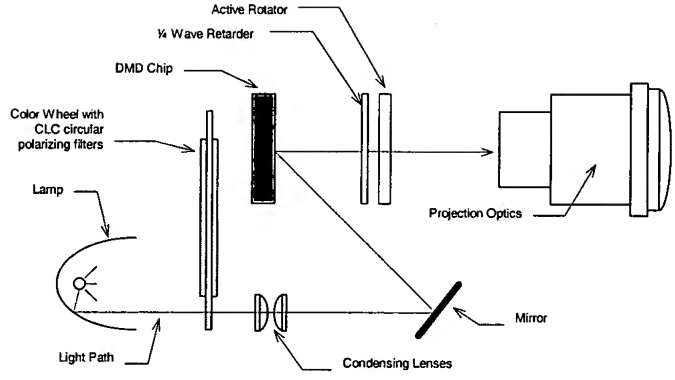


Figure 41- DMD Based Stereo 3D Projector, 3D Optical Configurations: E and Q

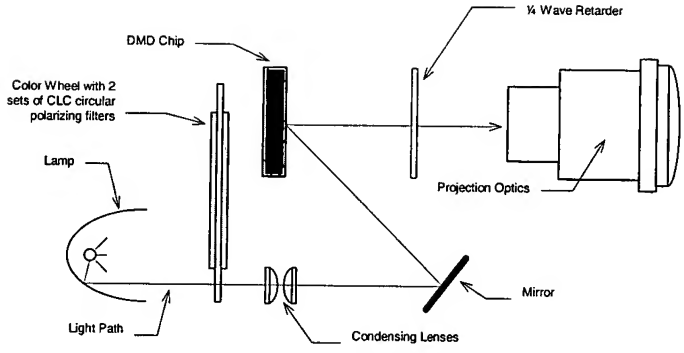


Figure 42 - DMD Based Stereo 3D Projector, 3D Optical Configurations: F, G, J, L, R, T, and V

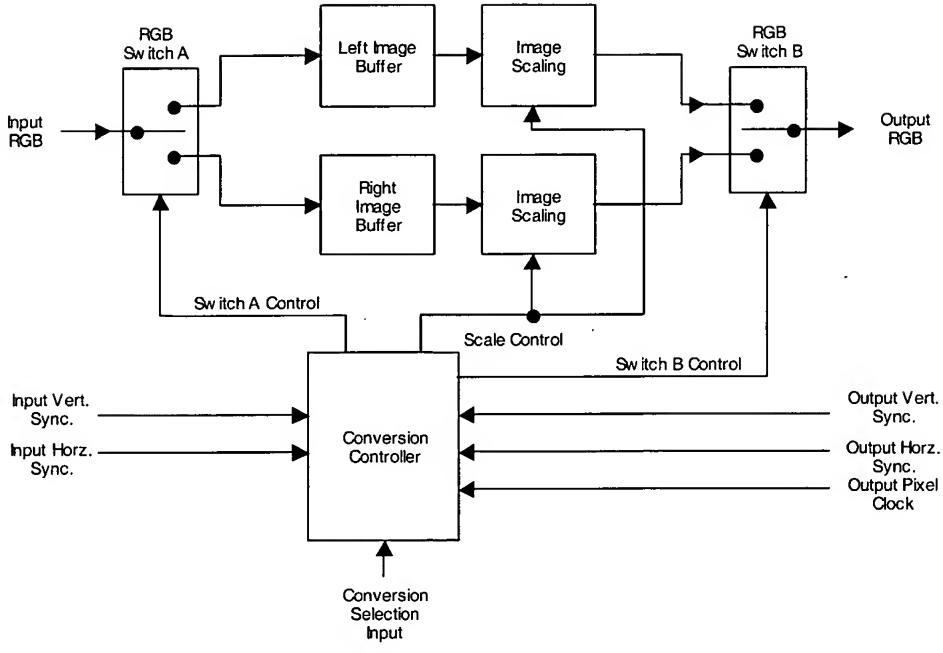


Figure 43. 3D Data Formatter Block Diagram

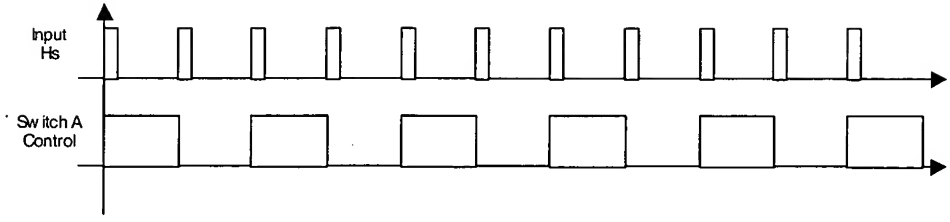


Figure 44. Switch A Control for Row-Interleaved RGB Input

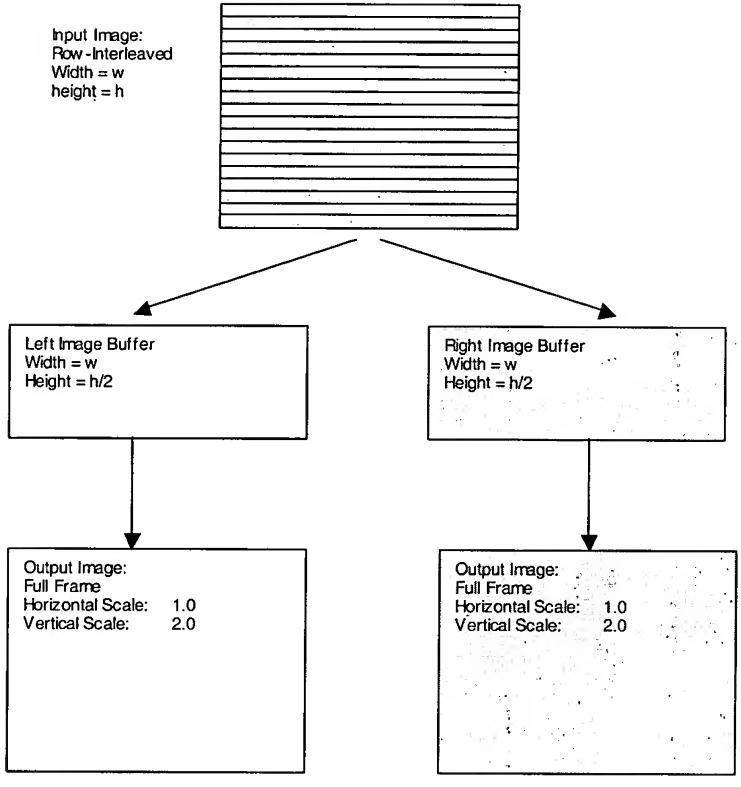


Figure 44. Output Scaling for Row-Interleaved 3D Format Input

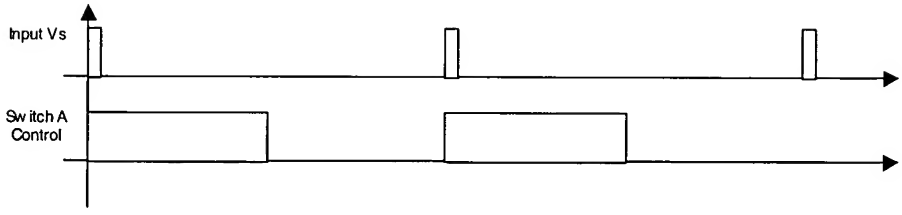


Figure 45. Switch A Control for "Over-Under" RGB 3D Format

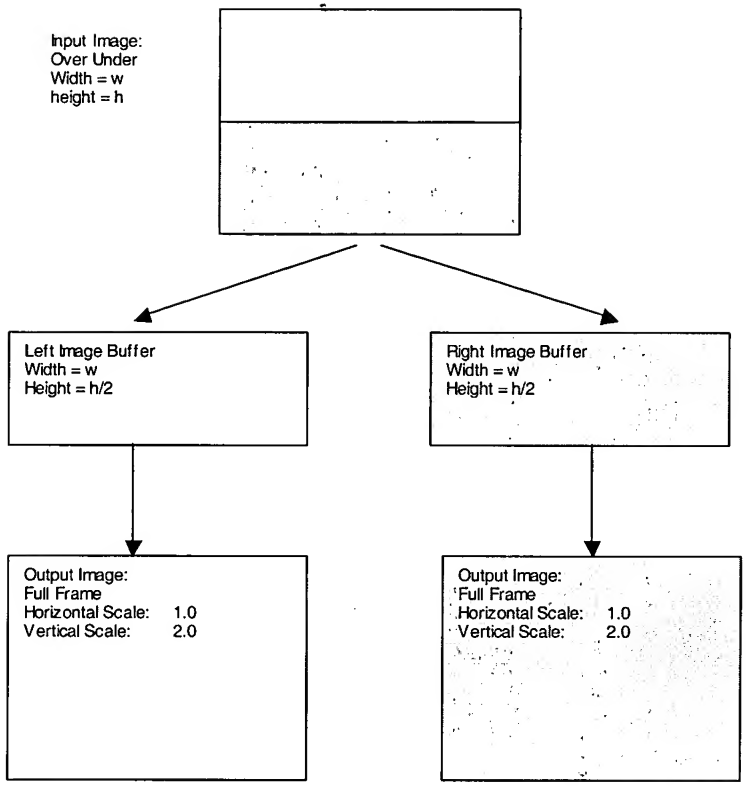


Figure 46. Output Scaling for Over-Under 3D Format Input

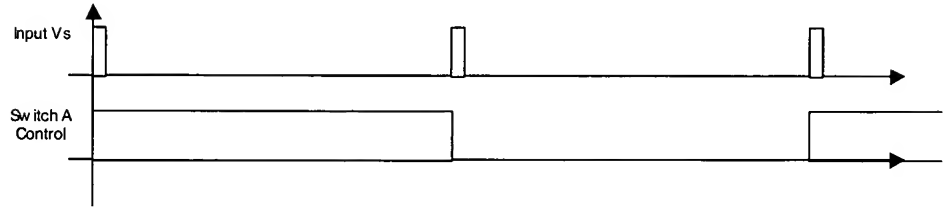


Figure 47 Switch A Control for "Page-Flipped" 3D Input

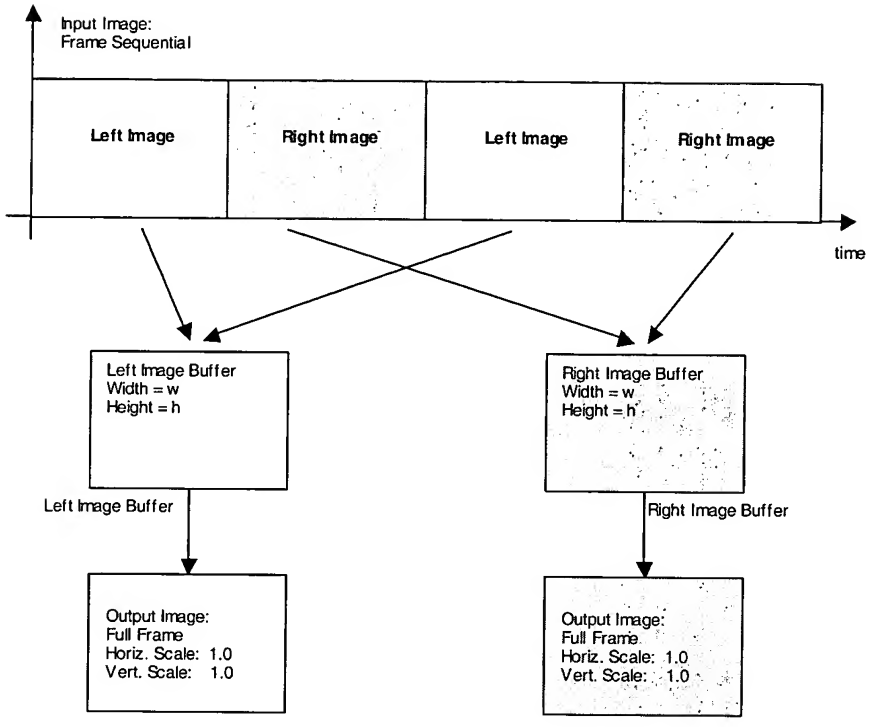


Figure 48. Output Scaling for "Page-Flipped" 3D Format Input

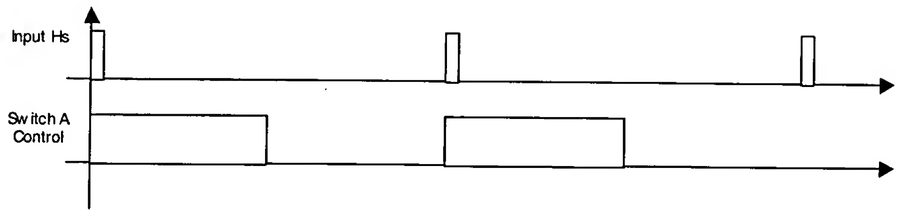


Figure 49 Switch A Control for "Side-by-Side" RGB 3D Input

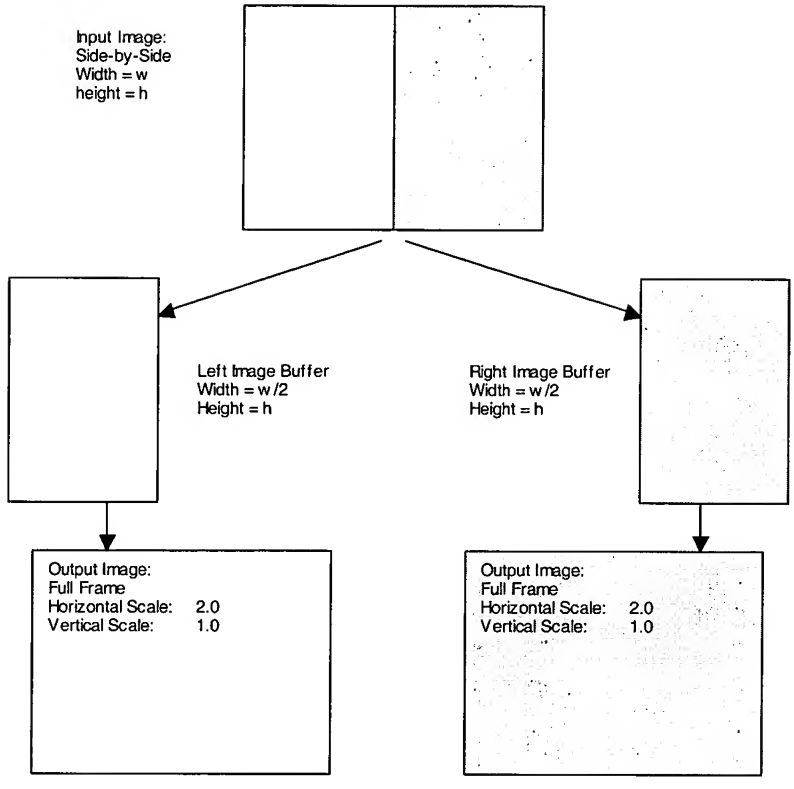


Figure 50. Output Image Scaling for Side-by-Side 3D Format Input

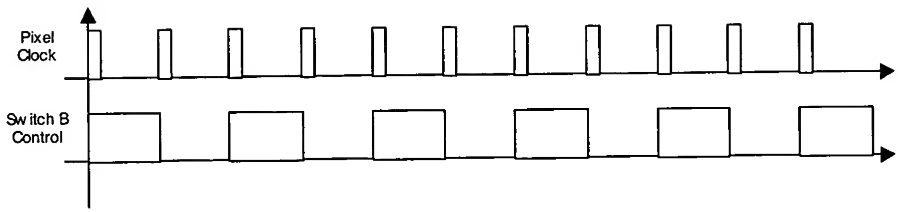


Figure 51. Switch B Control for 3D Data Formatter Block

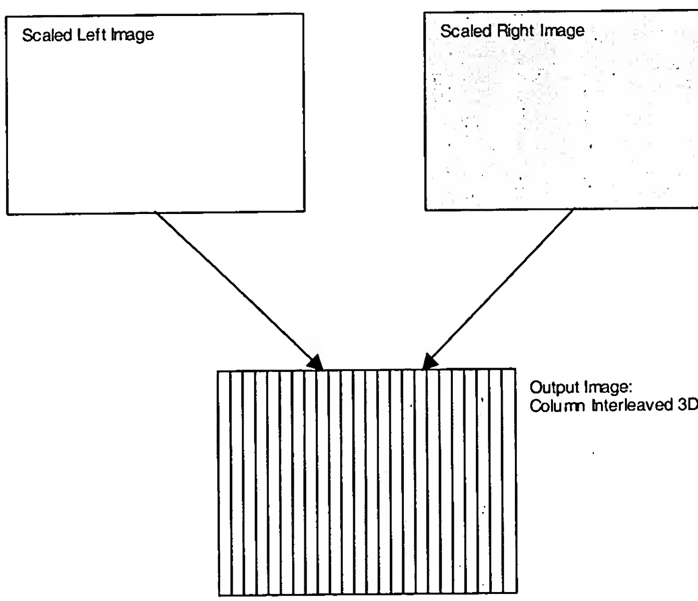


Figure 2. Graphical Illustration of 3D Data Formatter Output

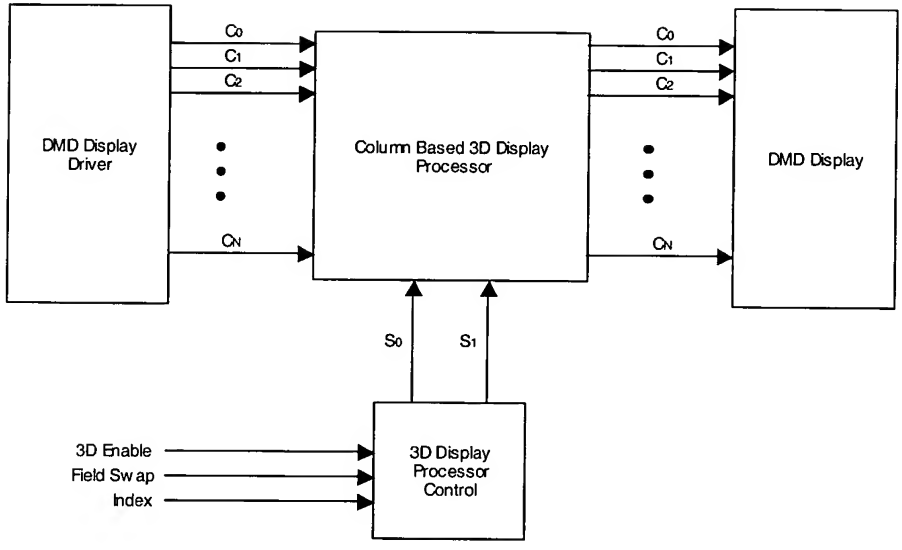


Figure 53. 3D Display Formatter

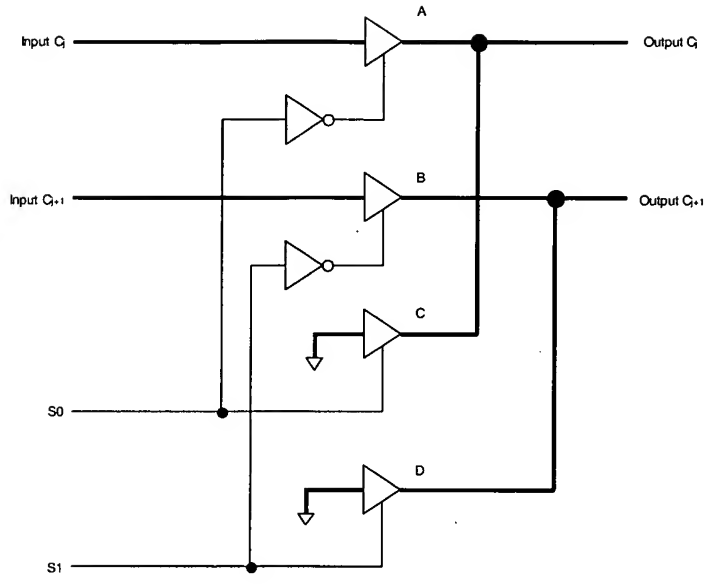


Figure 54. Block Diagram for 3D Display Processor Using Column Blanking Method

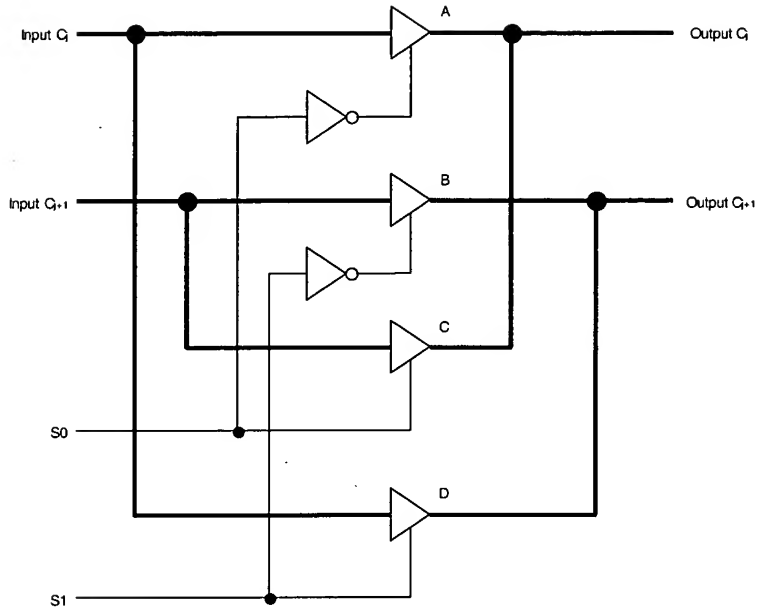


Figure 55

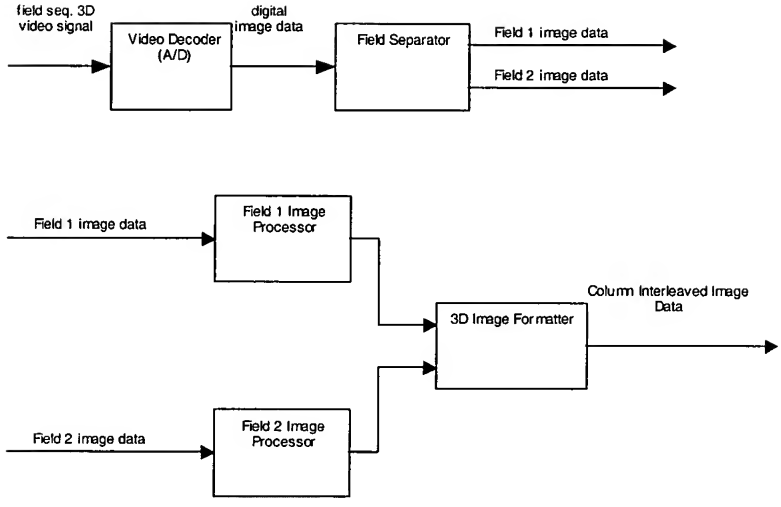

field seq. 3D
video signal
Video Decoder
(A/D)
digital
image data
Field Separator
Field 1 image data
Field 2 image data
Field 1 image data
Field 1 Image
Processor
Column Interleaved Image
Data
3D Image Formatter
Field 2 image data
Field 2 Image
Processor

Figure 57